NORTH CHICAGO WETLAND MITIGATION SITE

ISGS #84

IL 56/IL 47
FAP 326
Sequence #13406
Lake County, North Chicago, Illinois

Primary Project Manager: Keith W. Carr Secondary Project Manager: James J. Miner

SITE HISTORY

- 1995-2002: Previous site studies occurred during this period; monitoring was suspended by IDOT in Spring 2002.
- Spring 2009: IDOT tasked ISGS to resume targeted monitoring. Eight monitoring wells
 were installed in the northernmost part of the site to document restoration potential
 associated with tile removal in that area.
- Spring and Summer 2010: Drain tiles and invasive vegetation were removed.
- August 2011: ISGS added 14 soil-zone monitoring wells and one surface-water gauge to monitor various wetlands throughout the site.

WETLAND HYDROLOGY CALCULATION FOR 2012

Wetland acreage is not calculated for this site due to the limited scope of monitoring. In 2012, 15 locations on site were monitored to document hydrologic changes from restoration, including one surface-water gauge and 14 very-shallow (VS) wells equipped with data loggers. Only the wetland hydrology status at each of these point locations is presented.

In 2012, 11 of the 14 monitoring wells satisfied wetland hydrology criteria for greater than 5% of the growing season, and 10 of the 14 wells satisfied wetland hydrology criteria for greater than 12.5% of the growing season, according to the 1987 Manual. Using the 2010 Midwest Region Supplement (USACE 2010) to the 1987 Manual, 11 of the 14 wells also satisfied wetland hydrology criteria for 14 or more consecutive days during the growing season. These estimates are based on the following factors:

- The median date that the growing season begins in Waukegan, Illinois, is April 13, and it lasts 196 days (MRCC 2012); 5% of the growing season is 10 days, and 12.5% of the growing season is 25 days, according to the 1987 Manual. According to the 2010 Midwest Region Supplement, March 12 was the starting date of the 2012 growing season based on soil-temperature readings recorded on site with an ISGS data logger.
- Total precipitation for the monitoring period at the Chicago O'Hare International Airport weather station, Chicago, IL, was 84% of normal. During the March through May period of 2012, precipitation was 90% of normal, leading to typical on-site water levels in the early part of the growing season. However, during June through August, precipitation was only 56% of normal, resulting in a significant dry-down of the site.

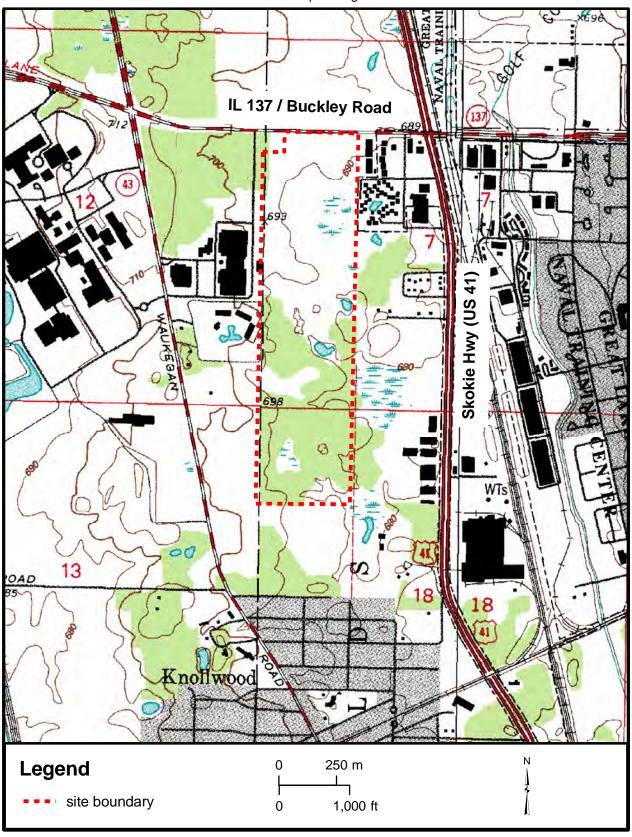
- In 2012, wells 09-01VS, 09-02VS, 09-05VS, 09-06VS, 09-07VS, 11-1VS, 11-2VS, 11-3VS, 11-4VS, 11-5VS, and 11-6VS satisfied wetland hydrology criteria for greater than 5% of the growing season, according to the 1987 Manual, and for 14 or more consecutive days during the growing season according to the 2010 Midwest Region Supplement. Further, wells 09-01VS, 09-02VS, 09-05VS, 09-06VS, 11-1VS, 11-2VS, 11-3VS, 11-4VS, 11-5VS, and 11-6VS satisfied wetland hydrology criteria for greater than 12.5% of the growing season.
- Gauge A also satisfied wetland hydrology criteria at an elevation of 209.55 m (687.50 ft) for greater than 5% as well as 12.5% of the growing season, according to the 1987 Manual, and for 14 or more consecutive days during the growing season, according to the 2010 Midwest Region Supplement.

PLANNED FUTURE ACTIVITIES

Monitoring of hydrology will continue until no longer required by IDOT.

North Chicago Wetland Mitigation Site (IL 56/IL47, FAP 326) General Study Area and Vicinity

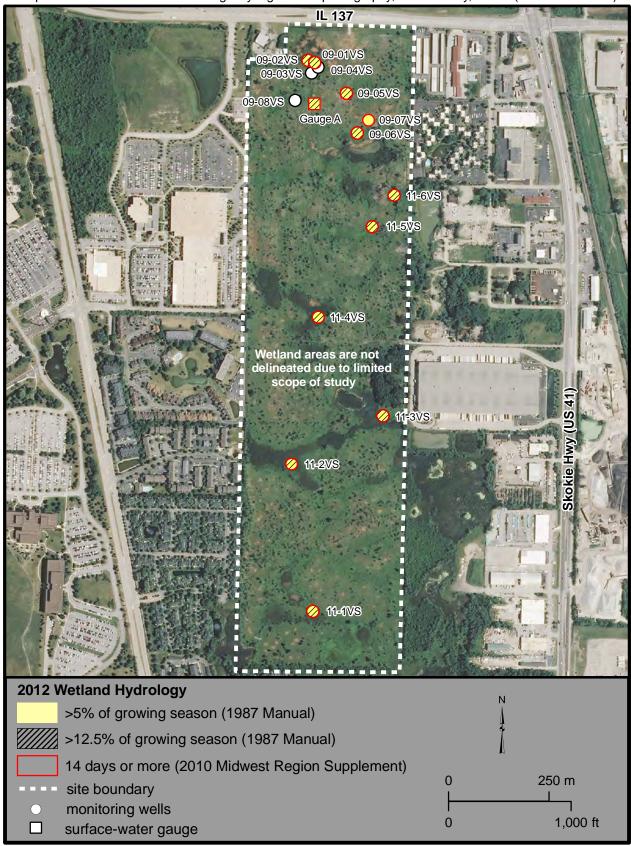
from the USGS Topographic Series, Libertyville, IL (USGS 1998) and Waukegan, IL (USGS 1998) 7.5-minute quadrangles



North Chicago Wetland Mitigation Site (IL 56/IL47, FAP 326) Wells Meeting Wetland Hydrology Criteria

September 1, 2011 through August 31, 2012

Map based on 2012 Farm Service Agency digital orthophotography, Lake County, Illinois (USDA-FSA 2012)



(logger)
- Well 09-02VS
(logger)
- Well 09-03VS ◆ Well 09-01VS ◆ Well 09-03VS ■ Well 09-04VS **▲**-Well 09-05VS ◆ Well 09-07VS O-Well 09-08VS Well 09-01VS Well 09-05VS Well 09-06VS Well 09-07VS Well 09-08VS O Well 09-06VS Well 09-04VS Gauge A (logger) (logger) (logger) (logger) (logger) Sep 2012 2102 guA in Monitoring Wells and a Surface-Water Gauge - North Part of Site Jul 2012 North Chicago Wetland Mitigation Site September 1, 2011 through August 31, 2012 Jun 2012 May 2012 Water-Level Elevations 2102 1qA Mar 2012 Feb 2012 Jan 2012 Dec 2011 1102 voN Oct 2011 Sep 2011 Elevation (in m referenced to NAVD, 1988) 211.0 210.5 208.5 208.0

- Well 11-2VS (logger) - Well 11-4VS (logger) - Well 11-5VS (logger) -Well 11-6VS (logger) ◆ Well 11-1VS ——- Well 11-2VS ● Well 11-3VS ■- Well 11-4VS ▲ Well 11-5VS Sep 2012 2102 guA Jul 2012 North Chicago Wetland Mitigation Site September 1, 2011 through August 31, 2012 Jun 2012 in Monitoring Wells - South Part of Site May 2012 Water-Level Elevations 2102 1qA Mar 2012 Feb 2012 Jan 2012 Dec 2011 1102 voN Oct 2011 Sep 2011 Elevation (in m referenced to NAVD, 1988) 209.5 209.0 207.5 207.0

-Well 09-04VS (logger) -Well 09-01VS (logger) -Well 09-02VS (logger) -Well 09-03VS (logger) ◆ Well 09-01VS ■ Well 09-02VS ◆ Well 09-03VS ■-Well 09-04VS Gauge A Sep 2012 S10S guA Depth to Water in Monitoring Wells and a Surface-Water Gauge - North part of site Jul 2012 North Chicago Wetland Mitigation Site September 1, 2011 through August 31, 2012 Jun 2012 May 2012 Apr 2012 Mar 2012 **Leb 2012** Jan 2012 Dec 2011 1102 voN Oct 2011 Sep 2011 Depth (in m referenced to land surface) -0.50 0.50 0.25

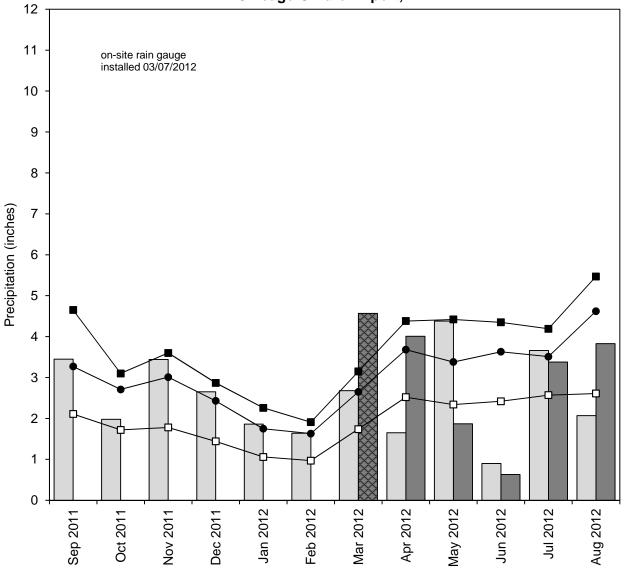
-Well 09-08VS (logger) -Well 09-05VS (logger) -Well 09-06VS (logger) -Well 09-07VS (logger) ■ Well 09-05VS SV90-60 II9W-0-◆ Well 09-07VS ● Well 09-08VS Sep 2012 2102 guA Jul 2012 North Chicago Wetland Mitigation Site September 1, 2011 through August 31, 2012 Jun 2012 Depth to Water in Monitoring Wells - North Part of Site May 2012 2102 1qA Mar 2012 **Eeb 2012** Jan 2012 Dec 2011 1102 voN Oct 2011 Sep 2011 -0.25 0.25 0.50 0.00 Depth (in m referenced to land surface)

- Well 11-2VS (logger) - Well 11-5VS (logger) -Well 11-6VS (logger) ◆ Well 11-1VS ——- Well 11-2VS ● Well 11-3VS ▲ - Well 11-5VS Well 11-4VS (logger) Sep 2012 \$102 guA Jul 2012 North Chicago Wetland Mitigation Site September 1, 2011 through August 31, 2012 Jun 2012 Depth to Water in Monitoring Wells - South Part of Site May 2012 S10S 1qA Mar 2012 **Feb 2012** Jan 2012 Dec 2011 Nov 2011 Oct 2011 Sep 2011 -0.3 Depth (in m referenced to land surface) 0.3 0.4 -0.4

202

North Chicago Wetland Mitigation Site September 2011 through August 2012

Total Monthly Precipitation Recorded on Site and at the Chicago O'Hare Airport, IL



- monthly precipitation recorded at Chicago O'Hare Airport, IL (MRCC)
- monthly precipitation recorded on site by ISGS

- —■ 1971-2000 monthly 30% above average threshold at Chicago O'Hare Airport, IL (NWCC)
- → 1971-2000 monthly average precipitation at Chicago O'Hare Airport, IL (NWCC)
- —□—1971-2000 monthly 30% below average threshold at Chicago O'Hare Airport, IL (NWCC)